DOCUMENT RESUME

ED 269 192 RC 015 695

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TITLE Using the Outdoors to Teach Social Studies: Grades 3-10.

INSTITUTION ERIC Clearinghouse on Rural Education and Small Schools, Las Cruces, N. Mex.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC.
PUB DATE 86
CONTRACT NIE-400-83-0023
NOTE 101p.
AVAILABLE FROM ERIC Clearinghouse on Rural Education and Small Schools, Box 3AP (Dept. RIE), New Mexico State University, Las Cruces, NM 88003-0042 ($5.50).
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052) -- Information Analyses - ERIC Information Analysis Products (071)

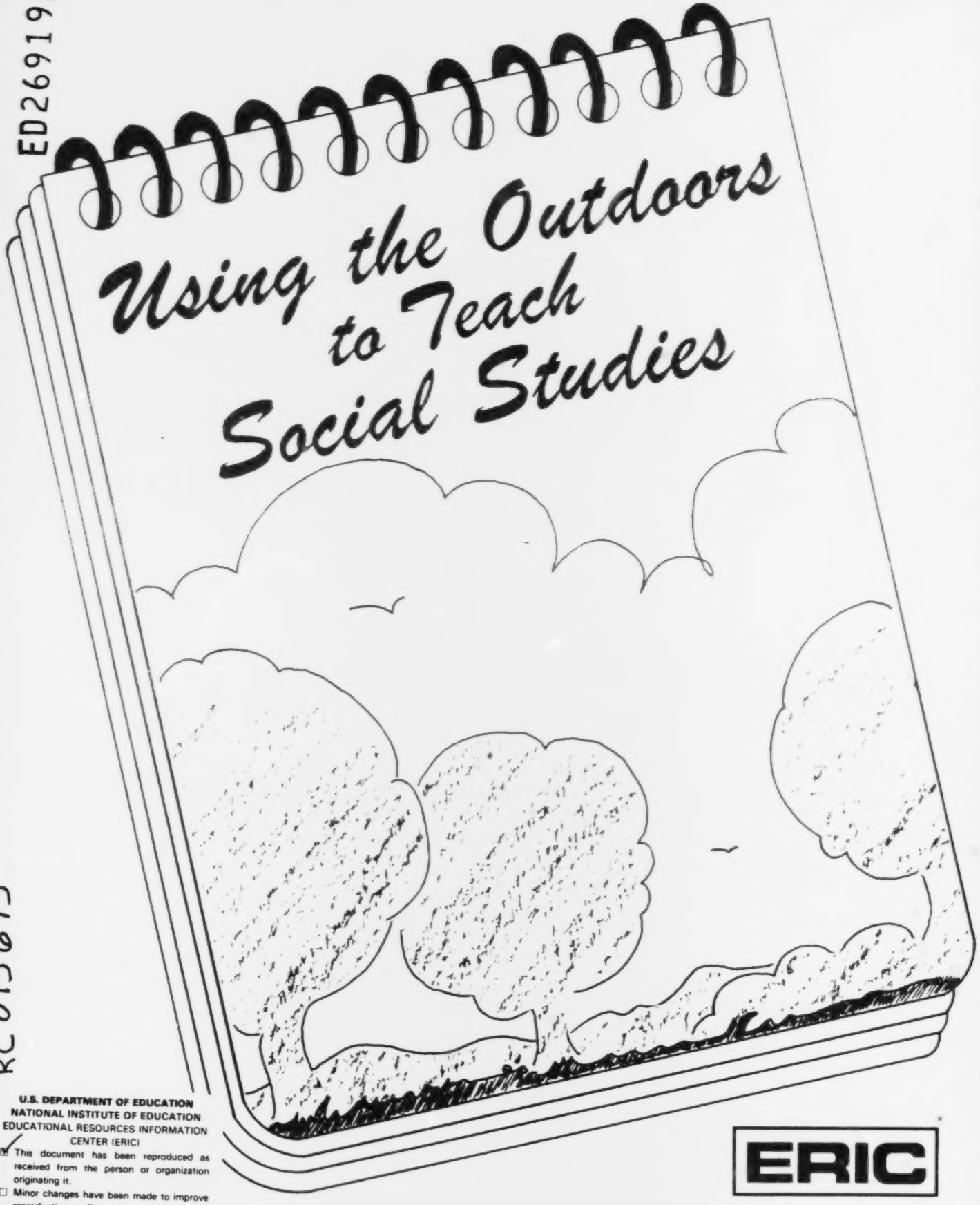
EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Community Surveys; Conservation Education; Elementary Secondary Education; Energy Education; *Environmental Education; Experiential Learning; Field Trips; Geography; History; Learning Activities; *Lesson Plans; Map Skills; *Outdoor Activities; *Outdoor Education; Political Science; *Program Descriptions; *Social Studies; Teaching Methods

ABSTRACT

Third in a series on utilizing outdoor education methodologies to enhance the academic curriculum, the guide contains lesson plans and case studies for teaching grades 3-10 social studies. The lessons are designed to further student awareness of personal and social responsibility toward the environment through the use of outdoor experiences which may help students to understand abstract concepts and provide them with a sense of community, contrasting experiences, and opportunities to gain self-responsibility. The guide offers specific suggestions for planning, organizing, and conducting field experiences grouped by objectives, mechanics, site selection, direct involvement, followup/evaluation, problems, and tips for conducting lessons outdoors. Eighteen sample lesson plans present topics such as people watching, value survey, map skills, exploring old farms, restoring native vegetation, seeing a city block, and energy costs. Each lesson plan states the problem, lists objectives, provides an introduction to the topic, describes procedure/activities, and lists evaluation questions. Four case studies illustrate using outdoor experiences to teach pioneer heritage, energy conservation, archaeological research, and local environmental problem-solving. Addresses for further information are given for each case study. Books, curriculum guides, periodicals, and organization names and addresses are given in a 69-item bibliography. (LFL)

ED269192

Using the Outdoors to Teach Social Studies



RC 015695

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USING THE OUTDOORS TO TEACH SOCIAL STUDIES: GRADES 3-10

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1986

ERIC Clearinghouse on Rural Education and Small Schools
(ERIC/CRESS)
New Mexico State University
Las Cruces, New Mexico 88003-0042

OERI

Office of Educational
Research and Improvement

This publication was prepared with funding from the Office of Educational Research and Improvement, U.S. Department of Education, under contract no. NIE-400-83-0023. The opinions expressed in this report do not necessarily reflect the positions or policies of OERI or the Department of Education.

Cover design by Debbie Guerrero.

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SERIES NOTE

Written for teachers in elementary and middle schools and for personnel at outdoor education centers, this publication is the third in an ERIC/CRESS series on utilizing outdoor education methodologies to enhance the academic curriculum. The guide suggests ways to develop student awareness of personal and social responsibilities towards the environment through social studies.

One of the more prominent purposes of outdoor education has been the application of outdoor education methodologies to enhance regular school curriculum. Curriculum subjects such as science, math, and social studies particularly lend themselves to this approach.

Together the authors bring over 95 years of experience and involvement in outdoor education, community studies, environmental education, and kindergarten through graduate school teaching. They are all faculty members of the Lorado Taft Field Campus at Northern Illinois University. Each of them has published several articles, papers, and a book on outdoor education. One of the authors serves as the Editor for the *Journal of Outdoor Education.*

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FOREWORD

We dedicate this monograph to all of our past students who helped us learn about the outdoor teaching of social studies. As outdoor educators at the Lorado Taft Field Campus of Northern Illinois University, we have found that our students and the environment have been our two most effective teachers. We also dedicate this publication to the teachers who will follow us, use some of our ideas, and improve upon our lessons for use in the vast outdoor classroom.

> As students and teachers relate to each other more as people beyond their habitual roles, the strength of the institution (school system) lies in its ability to allow for and encourage individual choices and expression by both students and teachers. The educational environment, the space where learning takes place, is no longer confined to the school building or to the usual separate subject disciplines. The physical space of the educational experience is the world, and the school must actively seek to rid itself of boundaries and limitations and allow for "outside-school routes" to learning.
>
> As the learning environment expands to include growth experiences outside of school confines, the title of teacher broadens to include many who were never before considered a part of the education cycle. Professionals, artists, and students themselves assume the task of guiding, supporting, and otherwise assisting those who are learning and growing. And so the classroom teacher often faces a crisis in redefining his/her particular contribution, and may even feel helpless when face-to-face with continual decentralization of the learning process. They are no longer the sole collectors and dispensers of information and students may even feel that what they have to offer is no longer relevant compared to what is attainable "outside."

From: *Outside-School Routes to Learning*
The Learning Cooperative
New York City Board of Education
Division of Educational Planning and Support
110 Livingston Street, Room 929
Brooklyn, New York 11201, pp. 1-2.

PREFACE

Using experiences and resources outside the classroom to reach educational objectives is generally considered to be an aspect of outdoor education. While the term "outdoor education" is occasionally applied more narrowly to describe education taking place only in a "natural" environment, many teachers have a broader perspective and use the term to include school site activities, field trips and all other out-of-classroom educational experiences.

Many social studies objectives can be most effectively reached through the use of one or more outdoor education activities. These experiences may be as complex as directly involving students in studying the history of their community, monitoring the passage of a city council ordinance, operating a community recycling center, or as simple as analyzing the preferences of a selected sample of consumers for a particular brand of product, examining epitaphs on tombstones or visiting a nearby historical marker.

This monograph, *Using the Outdoors to Teach Social Studies: Grades 3-10*, contains (a) a brief rationale for using outdoor experiences in teaching social studies, (b) some helpful suggestions for those planning, organizing, and conducting such field experiences, (c) a variety of sample lesson plans and ideas for lessons that can be used as presented or adapted for a particular situation, and (d) selected case studies demonstrating the actual use of the outdoors.

This monograph is intended to serve as a guide to teachers and administrators who want to utilize outdoor experiences in teaching social studies concepts, skills, and values and who want to more effectively meet ongoing curricular objectives in grades 3-10. It is also designed to help educators develop greater student awareness of personal and social responsibilities toward the

environment. Although educators have primarily focused on the middle grades, teachers at the high school level and at the primary levels have effectively utilized outdoor experiences for decades. While the self-contained classroom, in which many elementary teachers work, lends itself particularly well to outdoor activities, teachers in departmentalized situations have provided such experiences for their students also.

To summarize, this document is designed as a "hands on" guide to assist the practitioner in stimulating interest in and providing concrete suggestions for teaching certain aspects of the social studies in the outdoors.

WHY GO OUTDOORS TO TEACH THE SOCIAL STUDIES?

Introduction

This monograph deals with the use of outdoor or field experiences in teaching social studies. While it is primarily directed toward the educator at the middle school level, much of the content is applicable to the high school and primary levels as well.

The term "social studies" serves as an umbrella for the various subjects, topics, or units taught in schools that relate to the manner in which people interact both formally and informally. While variations occur from one region to the next in what comprises the social studies, most educators include these areas under the umbrella: (a) sociology (families, neighborhoods, communities, and cultures); (b) history (local, state, national, and international); (c) geography (the earth's surface); and (d) political science (government). In addition, other subjects include the areas of anthropology, economics, psychology, and environmental studies.

Whatever disciplines are included as the social studies, a variety of outdoor experiences are appropriate for enriching instruction.

Why go outside?

Why go outside the classroom to teach the social studies? This question must be answered before the additional time and effort needed to plan the field experience can be justified.

Educators use outdoor experiences when teaching the social studies (a) to provide students with a sense of community, (b) to help them to more thoroughly understand abstract concepts, (c) to provide contrasting experiences, and (d) to provide students opportunities to gain in self-responsibility.

Educators use outdoor experiences *to provide students with a sense of community* and to help make pupils more aware of their local surroundings. At the elementary school level or earlier, children begin to learn about the community in which they live. There they make the connections between themselves and everything else in their immediate environment. Unless they receive outdoor experiences in the community, they are forced to work from a narrow experience base and from limited concepts that are only as clear as written materials and television can make them. One cannot expect children to fully understand complex ideas of ecosystems or interdependence until they have first-hand contact with some of the elements of which such systems are composed.

Educators use outdoor experiences *to help students thoroughly understand abstract concepts.* Partial understanding is all we can expect when students deal with environmental and community needs and conditions indoors. So much is missed and so many concepts are hazy until we experience life directly. For example, the composition and magnitude of Chicago--or the appearance of Iowa corn fields--don't really hit home until one visits them. Concepts of the volume of solid waste produced by a city or the amount of silt in the Mississippi River are essential, but very vague, until students have experiences outside the classroom upon which to base their understanding.

Educators use the outdoors to provide students with *contrasting experiences.* Efforts to arouse environmental concern or interest in children who have never seen parts of the city other than their own crowded neighborhood are likely to bear little fruit. Most people just don't get motivated about much of anything unless they come to know alternatives. If children are to become interested in beautiful cities or a clean environment, they have to first

experience a model city or pure water and air. Live all your life on a noisy street corner and you become deaf to the noise and accept it as normal. When students (and legislators) of Missoula, Montana, smelled the clean air across the mountains, they became angry about polluted conditions at home. When Chicago-area students wade and fish in a pure stream, they may get concerned about conditions in the Des Plaines River near home and want to do something to correct the problem.

Educators can use the outdoors and the community as a classroom when their students can become involved. Many believe that the "fort-building-urge" that comes over nine- or ten-year-olds results from the need to do something. While building "forts" to hold off imaginary foes may be a fine play activity, perhaps teachers could channel this energy in more educational ways. Perhaps this creativity can be directed toward cleaning up a section of the stream that flows through town, or planting some trees or shrubs for shade and beauty, or exploring other improvement projects with the city government. In doing so, students might develop feelings of accomplishment about what they have done. As a young teacher several years ago, one of the writers was asked to involve his agriculture classes in seeding a lawn and planting trees in a city park. Three decades have gone by since then, and the results can still be seen.

Finally, educators use outdoor experiences to help their students develop *responsibility*. Actually, developing responsibility is what education is all about--responsibility to oneself, to others and to planet Earth. By involving students in experiences outside the classroom, educators help pupils understand some of the ways in which they are dependent upon each other and upon our planet. Irresponsible acts have caused many of our problems. Responsible acts will help us to ameliorate negative acts such as littering, wasting food, soil, energy, and

other resources, and to live in harmony. We have known for a long time that when students participate in community decision-making, community service, and improvement activities, they gain the know-how needed to function responsibly throughout their lives.

PLANNING FOR OUTDOOR INSTRUCTION

Providing field experiences requires special planning. Perhaps many teachers who dislike field trips and other outdoor learning experiences skipped a preparation step or two or suffered a bad initial experience. Our view is that the most critical phase of outdoor education occurs *before* the students ever leave the classroom.

Planning for teaching in the outdoors, whether in social studies or any other subject, differs very little from preparing to teach indoors. The same precepts apply with respect to goals and objectives, "mechanics," site selection, student involvement, and follow-up/evaluation. More care must be given to the preparation phase when planning an outdoor experience, because the "classroom" will be much larger and the instructional materials will not be found on a convenient shelf. Learning sites must be carefully chosen, and they must be evaluated prior to taking the trip. Provision must also be made for safety and to care for the "basic needs" of students. Very little learning occurs when the feet are cold, the bladder is full, or the throat is parched.

Purposes/Objectives. If teachers do not have specific objectives and goals for the outdoor lesson, it is unlikely that much of value will be learned. There are usually more "distractions" outside the confines of the school. One must know what is to be achieved--and the students must know that as well. When goals are unclear or incidentally conveyed to students, what they will learn is

likely to be insignificant. Although many outdoor learning experiences work like magic at times, these experiences have to be aimed and guided. Furthermore, the teacher should be confident that a particular field trip or school site activity is the very best way to achieve the objectives. Otherwise, why do it?

Mechanics: Outdoor lessons should be planned carefully and should include contingencies for anything that might happen, including (a) inclement weather, (b) undependable transportation, or (c) failure of resource people to produce or even appear. When doing your planning, communicate with all to be involved so no one is surprised. You need to prepare (a) yourself, (b) other adults, and (c) your students.

In preparing for the outdoor lesson:

1. Determine the reasons for going outdoors and then build mental enthusiasm for doing it!
2. Take care of administrative details early. Get the approvals from administrators, arrange transportation, and get permissions slips long before the big day. Keep everyone, including children and parents, informed.
3. Make a "dry run" visit to the site and meet with your guide or host at the site to discuss your purposes, student ages and backgrounds, and the various problems that might arise.
4. Check materials and determine what will be needed in the way of special apparatus, food, drink, expense money, and first aid.
5. Arrange for adequate supervision. Adequate personnel will vary according to the topic and the number of children. There is no firm guideline except that more supervision is usually better than less.

6. Develop your lesson plans very carefully and pay attention to details. (One experienced teacher who uses the outdoors states that each time he ventures outside the classroom, he plans more thoroughly than the time before.)
7. Communicate expected behavior (rules) toward other people and the environment. The students need to participate in this process in order to feel "ownership" of this code of behavior toward others and the earth.

Other adults may include administrators, parents, college students, and resource people. Teachers need to communicate the plans to them, including what you expect to accomplish and precisely what each supervisor is to do. It is not uncommon for teachers to conduct on-site training sessions for the adults who will accompany them on the field trip, and to provide pre-trip orientation sessions for parents.

In preparing for outdoor instruction, children must know (a) that you are looking forward to the trip, (b) the reasons for going, (c) the job or responsibility of each person, and (d) your expectations about student behavior. When organizing your students for field instruction, use small groups or teams whenever possible--each with a clearly defined role to play and tasks to perform.

Site Selection. Ideally, a variety of sites are available from which to select the best for meeting particular objectives. The site should contain the needed instructional resources, be within a reasonable distance, and be safe and accessible for use. Unfortunately, we don't usually have the luxury of selecting from several sites. We often have trouble finding a site that will meet all our needs.

Key procedures in the selection are evaluation of a site are:

A. Determine if the site is accessible. Is it owned by the school or can permission be obtained?

B. Determine the distance from the school. Is it within a reasonable distance for the amount of time available? Do traffic routes and parking create a problem?

C. Examine the site yourself to know what is there and what lessons are possible. Don't take a class to it without first going there yourself. What are the hazards and potential dangers? Record them and call them to the students' attention.

Need for direct involvement. Some teachers feel that students do not get enough direct involvement in the school setting and that this is essential if optimal learning is to occur. You are probably among them or you wouldn't be considering a social studies field trip. Some teachers spend all day in the outdoors without directly involving students in the learning process. If you're about to lecture all day, don't take them out!

Perhaps it is easiest to set forth what not to do. Don't herd your students from station to station and lecture to them very much. That can be done in the classroom as they view slides of the place. Plan as much involvement as the site and topic will permit. Examples of social studies areas in which high involvement is possible include (a) compass use and map reading, (b) map making, (c) recycling projects and environmental cleanup, (d) pollution monitoring, (e) living or local history, (f) archeological digs, (g) public opinion sampling, and (h) environmental impact analysis. Involving students in non-consumptive activities such as measuring, counting and describing is preferable

to using more consumptive practices such as digging, chipping, and collecting and minimizes student impact on the environment.

Follow-up and Evaluation. These are crucial aspects of outdoor instruction. Some contend that they are the most important aspects of the field trip. By taking interest in what has been done, the teacher shows the students that what was learned was important. Teachers should see a clear relationship between what is done outdoors and what is done in the classroom afterwards.

Back in the classroom, encourage students to (a) seek answers to some of the problems they encountered, (b) develop programs to inform parents about what was learned, (c) develop reports, projects and demonstrations based on the trip, and (d) communicate thanks to the resource people and others involved. Involve students in the evaluation of the activity and obtain their recommendations concerning a future trip with another class.

Problems Involved in Taking Outdoor Field Trips

> If localized history does supply this intimate, immediate, microscopic understanding of the working and the dynamics of our economy, society and democracy; if it indeed offers countless community examples of national developments and a healthy antidote to ready acceptance of generalization . . . if it proves the continuing importance of the individual in an era of strong concentration of governmental and economic power; if it helps the youngest pupil and can challenge the most sophisticated, and if the materials are readily at hand, why is it not universally acclaimed as an essential part of every school curriculum?*

Why haven't teachers used the outdoors more to teach the social studies? Several reasons are usually given. Time shortage and lack of knowledge are the most frequent responses. However, there is an increasing concern about

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*Clifford L. Lord, *Teaching History with Community Resources* (New York: Bureau of Publications, Columbia University, 1964), p. 17.

transportation availability, costs, and fear of lawsuits should accidents occur. Concern about what parents might think is also reported.

Time. Time has two aspects: (1) time to prepare, and (2) taking time "out of class" when there is so much to teach and test for. Not much can be done about the former except to rearrange priorities and manage personal time better. Some of the time used in preparing for a trip will be regained by generating more interest and needing less time to motivate students. Taking time "out of class" is not a good excuse for not going outdoors--if one considers the increase in what students can learn and retain through experience. At the secondary level, there is another aspect of "time" which concerns teachers who are assigned to five to seven classes each day in 45- to 55-minute periods. Principals wanting to encourage their social studies teachers to take classes outside have devised some interesting organizational and scheduling patterns in order to establish longer time blocks for field trips.

Preparation. Preparing to effectively use the outdoors in teaching the social studies is accomplished in various ways. Reading this guide is one early step. Participating in workshops such as "Project Learning Tree" and "Project WILD" is another (see Bibliography). Taking courses in outdoor and environmental education is a third. There are numerous opportunities, resources and materials available which will provide the competencies necessary to teach outdoors.

Transportation. Schools generally require that students be transported on field trips by bus--a regulation which can be expensive. Some schools include these costs in the instructional budget, but in some cases, they limit the amount of bussing available to each teacher. Other schools conduct fund-raisers, ask for grants from the PTA or Parents' Club or ask each child to pay a portion of the

fee. Buses usually must be scheduled weeks in advance so prior planning is necessary to overcome this and other problems.

Many teachers will find themselves limited to using sites close to the school. Careful examination of the area will reveal many accessible sites appropriate for social studies lessons within walking distance of the school or on the school grounds. More than one teacher has been pleased to find a flag pole on the school grounds or historical markers within a few blocks of the school.

Lawsuit and Injury. Some instructors believe that students are in greater danger of being injured on a field trip than in the school and that the teacher and school are more likely to be sued should an accident occur. The best defense against this possibility is thorough planning, strict adherence to school policy, and carrying sufficient insurance.

Parent Pressure. Negative parental opinion has been given as a reason for not using the outdoors to teach the social studies. While a few might object to field trips, our experience is that most parents want them. In fact, parents are sometimes critical of teachers who don't go outdoors, and they are often willing to help, too. Those parents who help out on field trips are valuable assets who lets others know about the benefits of outdoor learning.

TIPS FOR CONDUCTING LESSONS OUTDOORS

Several suggestions have been made earlier concerning strategies or techniques for teaching outdoors. Here are a few more:

1. Use the team approach in which several students work on an aspect of the problem. They should be together at all times and interact in taking notes,

measuring objects, and helping each other. It's much easier to keep track of 6 teams of pupils than 30 individual students.

2. Provide learning sheets for data-gathering and problem-solving. These guide sheets direct students to what is important and provide for learning accountability later on.
3. When extra adults are along, make sure they know their responsibilities, especially which students they are to be most attentive toward.
4. Provide writing boards, pencils and other needed equipment if appropriate. If only three compasses can be located, it may not be a good idea to focus the entire class on compass skills at one time.
5. Constantly be on the alert and insist on the same adherence to rules outdoors, on a field trip, as in the classroom. Make sure the students understand that study in the outdoors is not the same as recess.

THINKING GLOBALLY AND ACTING LOCALLY

Although the focus of any instruction outdoors is on local resources and people, we need to make connections between these resources and broader situations. What is happening in local factories or businesses relates to a larger picture. The state of people's feelings and aspirations is not unlike those held by people of the larger world. While the major concern of social studies is achieving and understanding the human condition and promoting world peace, this goal may best be achieved by the students studying local situations. A field trip by a high school social problems class from Florence, Montana, to the State Prison and the State Hospital for the Insane did more for those students' sensitivity to people than weeks of indoor instruction could have done. Studies

dealing with the work of a city council in getting a waste processing system underway are not unlike those of the state or federal agencies.

Most schools concentrate more on instruction concerning distant places and events than they do on teaching about local events. However, it is these local events that have the greatest day-to-day influence on our lives and largely shape our thinking about the nation and world. Clearly, more attention should be given to local conditions, history and resources in our schools.

SAMPLE LESSON PLANS

Now that a rationale for teaching aspects of the social studies outdoors has been established and some preparatory and follow-up suggestions have been outlined, we offer some sample lesson plans. If teachers carefully select and carry out some of these activities, our efforts will be rewarded and their students will benefit. The ideas that follow are not meant to be implemented exactly as they are written. Teachers will need to modify these suggestions according to student readiness and the appropriateness of available sites. The lessons will take varying amounts of time to prepare and teach. Teachers will know how these suggestions can best be used after trying them out. We envision the plans that follow as springboards for dedicated and capable teachers who want to enrich the lives of their students.

1. PEOPLE WATCHING

Problem: What can we learn about people by visiting a shopping center?

Objectives:

1. To observe how people meet some of their basic needs in a shopping center.
2. To improve observation skills and knowledge about the behavior of people.
3. To design an effective means for gathering answers to questions about human behavior.

Introduction:

People behave in different ways because their basic needs vary. Psychologists believe that people need to meet more than just their physical needs (i.e., food, water, shelter). We also need to feel a sense of security, belonging, closeness to others, positive self-image, enjoyment, achievement, and knowledge about and control of our surroundings. By observing people, we can often determine how these basic needs are being met. In this activity, students visit a shopping center to observe certain behaviors. These observations may be made elsewhere, but shopping centers usually offer a variety of people to watch, places to sit and eat, restrooms, and other conveniences.

Procedures and Activities:

Divide students into teams of two or three and select a question to investigate. Design the best way to find out answers to the questions below. Keep careful notes and re-assemble at a designated meeting place after about 30 to 40 minutes.

Questions:

1. Do people take the first available parking space or do they select one after considering several?
2. In a pair or group of shoppers, who appears to make the decisions about which stores to stop at or enter?
3. How many people shop alone compared to those who shop in a group?
4. Which display windows attract the most observers? Why do you think this is so?
5. If there are places to sit in the shopping center, where do persons of varying age groups sit the most often . . . the least? What is the average length of sitting time?
6. What reasons do shoppers give for visiting this particular center?
7. What security measures are taken to make the center safe?
8. Do people stop to look at their reflections in a mirror or shop window? What types of people do this?
9. Can you make people respond to you with a smile? What is the best way to accomplish this?
10. How many appear to know exactly what they want and where to go, and how many seem to wander and respond spontaneously?
11. What convenience facilities are used the most (i.e., telephones, restrooms, drinking fountains, and benches)?

Evaluation:

1. What problems did you encounter in obtaining answers to the questions? How did you overcome them?

2. What generalizations can you make about human behavior after making observations?
3. What are some other basic human needs (besides those listed) that you saw people meet?
4. If you were to repeat your investigations, how would you improve your methods of inquiry?
5. What are some other questions about human behavior that you could investigate at a shopping center?

2. VALUE SURVEY

Problem: How do communities reveal what people think are important by what they develop or construct?

Objectives:

1. To survey the community for evidence that people think certain values are important.
2. To make inferences about the function, purpose, or value of the object based on the evidence.

Introduction:

A value is something that people think is important or desirable to have. People's values are often reflected by what they develop or construct to make their lives better in some way. For example, traffic lights are erected at intersections because people want to control the movement of traffic along streets in a safe, convenient, and fair way. They build sidewalks so that people can walk safely without getting mud on their shoes. Many times, objects are developed to meet more than one value. In this activity, the students will survey an area of the community and try to determine what people value from the evidence they find. The survey data will be recorded on a chart and shared with the group.

Procedures and Activities:

Fill in the chart below. (An example is provided.)

Evidence	Function/Purpose	Value
EX: Traffic Light	Control traffic movement	Orderly traffic flow that is fair and safe for all

Evaluation:

1. Did you have difficulty in deciding what people value from the evidence found? Explain.
2. Did a particular object reflect more than one value? Explain.
3. Did you have difficulty in deciding on the function or purpose of any of the evidence? Explain.
4. Which values do you agree with and which do you disagree with?
5. Is there any type of object you would like to place in the community that would achieve a value that you think is important?
6. If you need help in determining the purpose of value connected with the evidence, whom would you ask for help?

3. POLLUTION OPINIONS

Problems: What are some public attitudes about various types of pollution?

Objectives:

1. To determine some community attitudes and opinions about various types of local pollution.
2. To chart or graph the survey results.
3. To predict how most people will respond to each question on the survey.

Introduction:

People sometimes disagree on what constitutes a problem and how severe it is. Environmental problems are sometimes difficult to identify because people do not perceive their surroundings in the same ways or value the same things. In this activity, students will administer a survey to determine if there is agreement about pollution problems and how people feel about each type.

Procedure and Activities:

Divide into teams of two and obtain the answers to several questions about pollution in your community by asking a certain number of people. (Decide how many people and questions would be a reasonable number considering the amount of time allotted.) You may modify these questions or devise your own depending upon your location. Make charts or graphs of your findings and present them to the rest of the group. Before you begin the survey, make your own predictions about how most people will answer each question.

Sample Questions:

1. What is the most annoying type of pollution in this area?
2. What type of pollution is the most dangerous to human health?

3. What is the most expensive pollution problem to solve? How much would you be willing to pay to solve it?
4. What are the top five causes of pollution in this community? (Rank them according to how important each cause is in contributing to a lower environmental quality; 1 = very important; 5 = not very important.)
5. Where can you go in the community to experience the least impact of the pollution?
6. Has the quality of the following resources in your area improved, gotten worse, or stayed the same over the last 5 years?

    a. water
    b. air
    c. soil

Evaluation:

1. How would you describe the level of community awareness of pollution problems in your local area?
2. Were you surprised at any of your findings? Explain.
3. What did you learn about local pollution problems from taking this survey?
4. How accurate were your predictions of how most people would respond to each question?

4. EXPLORING NEW TERRITORY

Problem: What are the possible uses for newly acquired, undeveloped territory?

Objectives:

1. To explore an outdoor area as though you were a settler looking for future land uses.
2. To record the evidence of wildlife, plants, and humans along three transect lines.
3. To follow three different compass bearings and end up in the same place.

Introduction:

Role playing is often an effective method of learning history and identifying with human beings who lived in the past. Early settlers who explored new territories had to survey the land to discover the best locations to develop homes, barns, roads, gardens, orchards, wells, and other human conveniences. In this activity, small groups of students will examine an area by following sets of three different transect lines. The lines will form a triangle and be determined by using compass bearings and prominent landmarks or markers. Natural and cultural evidence along the way will be recorded on a chart and conclusions will be drawn about the best places to establish a settlement.

Procedures and Activities:

Before doing this activity with students, the teacher must become familiar with the terrain of an accessible, natural area. From a central starting point, sets of three compass bearings are determined and recorded for each small

group of students. In order to have the groups finish near the starting point, establish the first compass bearing and the first stopping point (at a prominent landmark such as a road, large tree, rock, or building). Have several students in each group count the number of paces from the starting point to the first stopping point. (A pace is equal to two steps.) Using this first bearing (i.e., 40^{o}), add 120^{o} to establish the second bearing (i.e., 160^{o}) and direct the students to walk the same number of paces to a second stopping point. Place a marker there with the group number clearly written on it. Then to complete the third side of this equilateral triangle, add 120^{o} to the last bearing (i.e., 280^{o}) and direct the students to follow that to the beginning point.

> (Caution: Make sure that each set of three compass bearings take the students through safe areas. Also make sure they understand how to use a compass and to count paces to establish distances.)

Make up as many sets of bearings as you have small groups so that each group will have a different route to follow. You can plan the routes so the groups will observe different things and gather a variety of data.

ACTIVITY GUIDE SHEET

The British Government gave this territory to the settlers in 1783. This area must be explored and described before other settlers can move in.

You are employed to explore and describe this territory. Your task is to travel the routes assigned and to record data about the geology, geography, fauna, and flora along the way. Other teams are exploring other routes in this region. By putting all the data together, we will know better what is there. Record your data below as you walk the first side of the a triangle.

1. Your beginning point is _____. Your first stopping point is at _____. You are to follow a compass bearing of _____ degrees. Describe the terrain and land forms between your starting point and your first destination. Indicate the possible uses that settlers could make of the land between these two points. Be sure to count the number of paces walked to the first stopping point.

   _____

   _____

2. Your next bearing is _____ degrees. Reset your compass and follow this bearing for the same number of paces as you walked on the first side of the triangle. Indicate the possible uses that settlers could make of the land between the next two points.

   _____

   _____

3. Your next bearing is _____ degrees. Reset your compass and follow this bearing until you arrive at the beginning point of your triangle walk. Indicate the possible uses that settlers could make of the land between these two points.

_____

_____

As you walk along the three sides of the triangle, note the evidence of wildlife, plants, and humans.

*List the kinds of wildlife (as indicated by sightings, tracks, scat, etc.).

*List the main types of plants (trees, shrubs, etc.). Indicate what kinds of vegetation are dominant.

*List the evidence of human presence.

Wildlife Evidence	Number	Plant Evidence	Number	Human Evidence	Number

Evaluation

1. Was the area you explored suitable for human settlement? Explain.
2. Did your group finish at the beginning point after walking the three sides of a triangle? If not, what could have gone wrong?
3. Did you get a sense of how the early settlers might have felt when searching new territory? Explain.

5. SOCIETY IN ACTION

Problem: What are some of the necessary elements involved in establishing a new society?

Objective: To cooperatively solve problems related to establishing a new society.

Introduction:

This activity has been used successfully with groups of intermediate and junior high school students to increase understanding and appreciation of cultures other than their own. It provides them opportunities to work together in solving problems as well.

The activity should take place in a park or other natural area. Students are divided into groups of 10 to 12; each group is accompanied by an adult observer.

Each group is provided with a set of general instructions (see below) and a second sheet of specific instructions for a specific situation (see example on next page). All groups receive the same *required* tasks. *Group and individual tasks vary according to the situation provided.* The adult observer scores the group according to a score sheet that begins on the next page. After the time allowed (about 2 hours) the groups gather together and report.

Procedures and Activities:

1. Go over the instruction sheet for YOUR *Society in Action.*
2. Begin required tasks A and B inside the classroom.
3. Find a territory (location) for your society.
   A. Perform the required tasks.

B. Perform at least two of the group tasks.

C. Do as many of the individual tasks as possible.

(YOU WILL BE RATED ON A COMBINED POINT SCALE ACCORDING TO HOW MUCH YOU DO AND HOW WELL YOU DO YOUR TASKS.)

4. After completing your tasks, return your territory to as natural a state as possible.

5. Return to the main assembly area.

A. Bring all of the portable articles you have produced.

B. Be prepared to participate in an evaluation of the success of your society.

YOUR SITUATION: YOU ARE A BAND OF EGYPTIAN MERCHANTS.

Task Instructions:	Max. Points	Points
1. Large Group		
A. Give a name to your society.	5	_____
B. Establish a government, select leader(s) and delegate responsibilities.	20	_____
C. Determine rules of your society.	20	_____
D. Plan and lay out a campsite for your society.	10	_____
E. Create a banner (flag) for your society.	5	_____
F. Construct a camp compass rose (fixed with directions--north, south, east and west).	5	_____
G. Build a shelter.	10	_____
H. Select a lookout station.	10	_____
I. Make or design a costume typical of clothes which would be worn in your situation.	5	_____

Task Instructions	Max. Points	Points
2. Small Group (to be done by a group no larger than five)		
A. Make an accurate map of your campsite, with a legend, scale, and notable landscape features.	15	_____
B. Devise a system of writing	15	_____
C. Design a future town	15	_____
3. Individual		
A. Capture a fish	5	_____
B. Make a weapon	5	_____
C. Make a container for water	5	_____
D. Make some sort of headwear	5	_____
E. Weave a mat or basket	5	_____
F. Make some jewelry	5	_____
G. Dig a pit 3' x 4' x 1'	5	_____
H. Make a clay tablet and write on it	5	_____
I. Make a work of art that you can sell or trade to another society	5	_____
J. Build an animal trap	5	_____

Evaluation:

1. Which tasks were most difficult? Why?
2. What problems did you encounter when working in a group?
3. In general, would you rather work as an individual or as part of a group?
4. What tasks do you think early societies found most difficult to accomplish?

6. MAP TYPES

Problem: How can we use maps in the field?

Objective: To study various kinds of maps to determine:

A. How to use them

B. What they mean

Introduction:

Maps are useful not only for finding our way around, but also for locating specific features, such as hills and valleys, rivers, buildings, roads, and other landmarks. Maps are also generally designed for specific purposes, such as traveling on roads, determining elevation, or identifying rock or soil types.

Questions:

1. What kinds of maps have you used?
2. How were these maps different?
3. How were they alike?
4. How might these maps be used for different purposes?

Procedures and Activities:

Obtain maps of different types, including land use, roads and towns, building locations, property owners (plats), soil and rock types, buildings and other cultural features, and landforms and elevations (topographic).

Visit a site that is included on several different maps. List features that students would include on a map of the site. Compare the list with existing maps to discover which features are included on each map.

Which map comes closest to matching the class' list? Why?

_____

_____

What was the purpose of the map?

_____

_____

For what purposes might the other maps be used?

_____

_____

Do the maps indicate features in addition to those listed by the class?

_____

_____

Evaluation:

1. What kinds of maps have we used?
2. What kind of information does each map give us?
3. How might we use each map for different purposes?

7. MAP SCALES

Problem: What are the advantages of using maps of different scales?

Objectives:

1. To learn that maps are drawn to different scales according to uses.
2. To decide which scale map is the best to use for specific purposes.

Introduction:

Maps are often drawn to different scales: a map that covers a large area usually has a small scale, and a map that covers a smaller area usually has a larger scale. Large scale maps reveal much more detail.

Questions to ask: How big would you make a map of a specific area in order to show specific details?

roads	towns
houses	trees
rivers	something of your own, or a place where you play

Procedures and Activities:

Obtain maps of the same area, but of different scales (for example, a state highway map, a county map, a township or neighborhood maps, or an aerial photo of one property in the township or neighborhood which will progressively focus in on one smaller area of land, each with more detail than the previous one). Take the maps to the area that is shown in greatest detail.

Discuss:

1. How do the maps change as the scale becomes larger?
2. What details can you see in each progressively larger scale map that you couldn't see before?

3. How might these maps be used for different purposes?

4. Which do you find more useful? Why?

5. Which would you rather use if you were going to

   (a) drive through the area?
   (b) hike cross country?
   (c) locate a homesite and then landscape it?

Locate landmarks in the field. Draw them in on the maps. On which maps can certain landmarks be drawn better?

Evaluation:

1. Why are maps drawn to different scales?

2. What would be the appropriate scale to show (a given landmark)?

8. MAP READING

Problem: Compare new and old maps and aerial photos of a city or township. What changes have taken place over the years?

Objectives:

1. To read maps and aerial photos.
2. To compare maps and aerial photos to determine where features are/were located and when changes took place.

Introduction:

Ask the following questions to motivate the students:

1. What changes have taken place in this area over the years?
2. How can you find out what changes have taken place?
3. How can maps and aerial photos help answer these questions?

Procedures and Activities:

Obtain old and new maps and aerial photos of the area. Sources of maps:

Homes	USDI Geological Survey
City Hall	Soil Conservation Service
Realtors	County Courthouse

Arrange maps chronologically and according to type. Note any changes that occurred during the time elapsed between one map and the other. For example:

New roads/roads abandoned	Buildings erected/demolished
New housing developments	Channels, dams, etc.

Using the maps, go to the areas where changes have taken place. Prepare a display with a time line indicating the changes that have taken place over time. Include dates of changes (if known). Place maps and aerial photos in proper positions on the time line.

Evaluation:

1. How many changes were found on each pair of maps?
2. When did these changes occur?
3. Has the land use changed for the better or worse?

9. EXPLORING OLD FARMS

Problem: What can we learn about natural resources, land use, and technology from exploring old farms?

Objective: To explore old farms and infer how people used them over the years.

Introduction:

Old farms can provide a wide variety of important information about the history of an area. In this activity, students divide into groups and investigate a farmhouse, surrounding area, and barn to find out more about natural resources, land use, and technology.

Procedure and Activities:

Obtain permission to explore an old farmstead which is either occupied or abandoned. Determine the potential safety hazards and inform the students about these. Divide the students into groups and assign them some questions to investigate. Some sample questions are:

A. House

1. What kinds of materials were used in the construction?
2. With what tools were the logs shaped?
3. What material was used to chink the house?
4. How might the logs have been lifted into place?
5. How is the structure held together and made strong?
6. About how old is the main part of the house? Are there any additions?
7. What forms of heating were used in the house over the years?
8. Where were the fireplace and chimney located?
9. What items found in the house could have been used 50 years ago . . . 100 years ago?
10. What evidence can you find of the furnishings and decorations?
11. Draw the house as you think it looked when it was built.

B. Surrounding Area

1. Where were the outbuildings and other structures located?
2. Where did the water supply for the house come from?
3. What evidence is there of a well? . . a cistern? . . a water filtering system? Explain.
4. What kind of trees are found in the front yard?
5. How might they have been useful to the occupant?
6. Did they grow naturally or were they planted? How do you know?
7. About how old are they?
8. What is the story of the stump on the north side of the house?
   a. What kind of tree was this?
   b. When was it cut?
   c. Why was it cut?
   d. What tools were used?
   e. In what direction did it fall?
   f. At what time of year did it grow most rapidly?
   g. How old was it when cut?
   h. In what year did it grow most rapidly?
   i. Was it cut before or after it died?
   j. How many kind of nonflowering plants (lichens and mosses) can you find growing on the stump?
9. What things are still growing in the garden?
10. What other things might they have had in their garden?
11. Where did you think the fruits and vegetables were stored? How were they kept from spoiling?
12. Draw a diagram of the outbuildings surrounding the house.

C. Barn

1. Approximately how big is the barn?
2. What was the barn used for?
3. What kind of lumber was used in the construction?
4. What advantage did the "bonnet" serve?
5. How was the hayfork maneuvered?
6. Was there a feed chute in the barn? Why was it used?
7. About how many wagon loads of hay could the barn hold?
8. How old is the barn?
9. Was this the only barn ever built on the property?
10. What kind of life can you find inhabiting the pond?
11. Diagram the barn as it once was when in use. Indicate the use made of the various areas.

D. General Questions

1. What were some of the necessary chores and activities performed by the people living here?
2. How did the family living here get most of their income?
3. How could you find out more information about the house and barn?
4. What other interesting features of this property could be explored? For example:

a. roads	d. dumps
b. fences	e. woodlots
c. erosion	f. bodies of water

Evaluation:

1. What did you learn about natural resources, land use, and technology?
2. Do you agree that "the good old days" were better or worse than the present?

10. LAND USE PLANNING

Problem: What is it like to participate in an activity designed to simulate how government action can affect the quality of the environment?

Objective: To participate in a simulated land use planning activity to capture a sense of the process of participating in the process of change.

Introduction:

This activity should be proceeded by a brief discussion of how a good citizen is expected to contribute to the planning process. Such participation is within a legal context and often involves competition with those holding different views on what is desirable government action. In such situations governmental officials might need to choose between two activities based on the best criteria they can use to help guide them.

Even though one's views may not prevail, an open planning process helps to get political leaders in touch with what the public is thinking. Such interchanges help prevent decision makers from straying too far from the public's willingness to support certain actions.

Procedures and Activities:

Land Use Planning Simulation

1. Have the students read the following description of a plot of land that has become available for development.

2. After the students have read the description, have each pupil list the possible uses for the land. The way they want the land developed should be consistent with the needs of the town as described in the reading.
3. Have the students tell you their ideas and list them on the chalkboard, stopping after about 15 ideas.
4. Have the group help you combine the ideas into categories such as recreation, industry, utilities, housing and commercial.
5. Next organize the class into teams according to the categories listed above.
6. Then have them develop a plan of how they would develop the land, and draw it on a piece of newsprint. Also inform the students that they will need to develop a presentation for their classmates which tries to convince them that their proposed use is the best use for the land.
7. Next, take one student from each team to serve as a member of the County Board of Commissioners who will decide which project best fits the needs of the community. Ask them to reread their description of the land to determine what criteria should be used to judge the worthiness of the projects proposed by their classmates. The board then elects a committee chairperson to conduct a meeting in which students present their projects to the class. Each member of the committee should keep a written record of the value they place on each project idea presented to them. After the presentations, the committee members determine which project best meets community needs.
8. Plan a field trip or assign groups of students to attend an actual meeting of a city or county planning commission.

BACKGROUND INFORMATION SHEET: CENTERPLACE CITY*

Read the background information for Centerplace City, and then list possible uses of the vacant farmland.

"One square mile of unused county farmland, four miles northeast of the city, is now available for the city's use."

1. The population is 250,000 and rapidly increasing.
2. The city's boundaries are being extended, but the suburban fringe is expanding even more rapidly.
3. The rapid population growth is accompanied by demands for more housing, more jobs, additional city services, and recreational areas.
4. The power for industrial uses, adequate public transportation, and a skilled labor force are available.
5. The city is located near forests, which are to the north.
6. The land to the east is devoted mainly to farming.
7. The Pipe River is unpolluted and is the source of irrigation water as well as the municipal water supply.
8. The river is too small for freight transportation, but logs could be floated on it.
9. The gravel bed of the river is appropriate raw material for concrete manufacture.
10. The present sewage treatment plant and garbage disposal area are at maximum capacity. The citizens of Centerplace are concerned about the maintenance of a scenic regional environment.
11. The County Board of Control is the authority for land zoning, and many citizens' groups are developing to influence zoning decisions.

12. List possible uses of the land below:

_____	_____
_____	_____
_____	_____

Evaluation:

1. What kinds of feelings did you have while participating in the simulation?
2. How did you feel about the final outcome?
3. Even though someone else's idea was chosen for implementation, what is the value of your participation in the planning process? . . for government officials?

* This lesson was adapted from materials developed by the Forest Service, U.S. Department of Agriculture and appeared under the title, "Teaching Materials for Environmental Education," p. 45.

11. WRITING ENVIRONMENTAL IMPACT STATEMENTS

Problem: How can writing an environmental impact statement help in making decisions about proposed development projects?

Objectives:

1. To be able to describe the parts of an environmental impact statement and its purpose.
2. To prepare an impact statement for a real or hypothetical situation.

Introduction:

The Environmental Policy Act of 1969 officially established the practice of evaluating the effects of proposed changes on the environment. An Environmental Impact Statement (EIS) is a report which examines a project idea in detail. A project which may significantly affect the quality of the environment (such as mining in a national forest) needs study. Environmental changes bring benefits as well as problems. The purpose for preparing an EIS is to weigh the values of a project against the damage that may result. Damage can include spoiling the scenery, killing animals on the endangered list, or any other negative result. The evaluation of a project is usually done by professionals including ecologists, engineers, social scientists, and planners. After examining a completed EIS, governmental officials decide whether or not to allow the project to be carried out.

Environmental impact considers how much the proposed project will affect different parts of the environment. It also considers how important these changes will be to people. Usually, the "how much" and the "how important" questions are expressed in numbers as well as in writing. A proposed mining project in a national forest can have an effect on an endangered species that

might be rated "5" on a scale of 1 to 10. If the importance of this animal is considered great, the evaluators might assign a "10." One way to express these two parts of environmental impact on an endangered species is "5/10."

Procedures and Activities:

Usually a series of steps is involved in the preparation of an EIS.

1. The objective of the project is stated.
2. The technology necessary to accomplish the objective is studied.
3. One or more alternative ways to achieve the objective are proposed.
4. The characteristics of the existing environment (before the proposed project) are described.
5. The benefits and costs (in money) are itemized for each alternative way of meeting the objective.
6. The environmental impact of each alternative is predicted.
7. The separate actions involved in the project are listed and their effects upon various parts of the environment are determined.
8. A summary and list of recommendations are made at the end of the report.

A Hypothetical Situation in a Local Setting:

For several years, a project to create a small pond at the Taft Campus has been studied and discussed. Until now, no agreement has been reached about where the proposed pond should be located or how it is to be constructed. A body of water would be very useful as a study site for aquatic biology as well as a water source in case of a fire. It would benefit wildlife and provide additional educational and recreational activities for the many students who visit.

Recently, the Director recommended that a dam be constructed in a portion of the gully leading to the river. The proposed dam site has been staked out and research has begun to test the feasibility of such a project. A total of $220,000 has been allocated for construction of the dam and improvement of the shoreline.

You have an opportunity to influence the decision about whether this particular project should be implemented or not.

The process of developing an Environmental Impact Statement has just begun. An EIS will be completed by the spring, and the decision about whether or not to construct a dam will be made by next summer. You can help in the development of an EIS by gathering some information for the final support. The following data are needed:

I. **Description**

1. Describe the predominant tree species, understory, and herbaceous plants in the project area.
2. Find evidence of any wildlife living in the project area.
3. Describe some key soil characteristics and geology in the project area.
4. Describe the overall ecology of the area in qualitative terms. (How valuable is the area to be preserved?)
5. Describe the meteorological conditions in the project area.
6. Describe the past, present, and proposed land use.

II. **Environmental Impacts**

1. Discuss impacts which may occur to wildlife, water quality, air quality, noise, historical evidence, etc.

2. Discuss the impacts the project will have on the physical environment such as soils, geologic formation, hydrology, drainage patterns, etc.
3. Discuss how to minimize adverse environmental impact (short-term and long-term).
4. Discuss the economic impact of the proposed action.

III. **Alternatives**

1. Evaluate other alternatives considered, including taking no action.

IV. **Short-Term Use vs. Long-Term Productivity**

1. Discuss environmental impact and economic costs and benefits for present and future generations.

After investigating as many aspects of the proposed construction project as time permits, write a paragraph summarizing your major findings, conclusions, and recommendations.

Evaluation:

1. What is the purpose of an Environmental Impact Statement?
2. What types of information are collected in the writing of an EIS?
3. After collecting the necessary information, what conclusions did you reach about going through with the proposed project?
4. How did the actual investigation of a local setting help you in deciding whether or not to permit the proposed development?

12. POPULATION CHANGES

Problem: How has the local population changed over time?

Objectives:

1. To learn how the population has changed over time.
2. To learn why the original settlers came to a particular place.
3. To learn the roles filled and services provided by each new wave of population

Introduction:

Ask the following questions to motivate the students:

1. How many nationalities do we have represented in our town?
2. How many places in the U.S. and throughout the world did they come from?

Procedures and Activities:

1. Have students ask their parents and then list the answers to each question:

   How long has each family been in the town? Where did they come from before that? What was the country of origin of their ancestors?

2. Identify people in the community:

   Who came from different places within the past generation or two, and whose ancestors came from different countries?

3. Interview people in these categories. Questions to ask:

   Where were you, your parents, and grandparents born and raised? Who was the first member of your family to come here? What kind of job did they have? What kind of job do you have now? (List and number.)

4. Compile information gathered from individuals. Prepare a chart including: Places people came from; jobs they held when they came; and primary jobs held from the founding of the town through the present. Are the townspeople producers of goods, services, etc.? (List and number.)
5. Study about the main jobs held in the town over time. Make reports to the class on these jobs. Prepare reports on how the town has changed over time. Write and give a play to other students and the community on changes in the town.

Evaluation:

1. How has the population changed over time?
2. Why did the original settlers come to this place?
3. How have the jobs changed over time?
4. Is there a relationship between types of jobs and fluctuations in population?

13. SEEING A CITY BLOCK*

Problem: What can be learned about the community from walking around a city block?

Objectives:

1. To make observations of buildings, streets, utility poles, and other familiar things to learn new information.
2. To develop questions and activities which enable others to learn more about a city block.

Introduction:

We often take familiar surroundings for granted. Often, when we become aware of different aspects of our community, we want to learn more about them. In this activity, the leader walks around a city block and develops a set of questions and tasks for students to investigate. These investigations can be accomplished with the aid of simple equipment and pencil and paper. After completing the activities, the students in small groups can develop their own questions and tasks for others to explore.

Procedures and Activities:

The leader and/or students prepare a guidesheet to aid in the investigation of a city block. After the guidesheet is prepared, students answer the questions and do the activities. A sample set of questions is included from a walk around a city block in Saratoga Springs, New York:

Exit this building at Spring Street--Go West, young person. Look very carefully at this old building. Is the brickwork uniform throughout? What might account for this?

Go to the utility pole marked as follows:

Koppers
Ch - 70
SP - P
5 - 40

What do you think these codes mean? What other characteristics reveal the story of this pole?

Continue across the street and observe the other church building. What do the two dates on the cornerstone mean?

Look up toward the roof. What evidence of animal homes can you find?

What kind of plant is growing near the roof?

Now look down to see how many different kinds of plants are growing along the base of the building and between the sidewalk cracks. Sketch one plant that you recognize.

How is this building now being used?

Look for a four-leafed clover next to the sidewalk. What good luck has entered your life recently?

If a raindrop fell in the center of the street, where would it roll? Pretend that you are a raindrop and see where you roll!

Notice the evergreen in front of the Skidmore Shop. Look at the underside of a needle. Can you find the "railroad track" markings?

Along the way, smile and greet any people you meet. What are their reactions?

Head south on Circular Street. How might have this street received its name?

Crush and smell the feathery leaves growing on the grass in front of Route 9P state highway sign. This plant is Yarrow and was sold in old apothecary shops as a tonic. Find other aromatic leaves along the way.

Go east on Union Avenue. What University was once across the street?

Turn north at the corner on Regent Street. What might have caused the depression in the grass along the sidewalk?

The next building, constructed in 1904 with the Ionic columns, has a raised pattern on the side of the steps. Can you take a rubbing of this pattern?

Return to our starting point and share some highlights of your walk with someone. Are you more aware of the potential of a city block for learning?

Evaluation:

1. What new awareness and information did you gain from following the guidesheet?
2. What new awareness and information did you gain from writing a guidesheet?

*From: Clifford Knapp and Joel Goodman, *Humanizing Environmental Education*, (Martinsville, Indiana: The American Camping Association, 1981), pp. 32-34.

14. AN ENVIRONMENTAL STUDY OF A TOWN

Problem: What should be done to improve a natural or cultural resource in your town?

Objectives:

1. To select a local natural or cultural resource and determine what should be done to improve it.
2. To gather information about that resource through observations, interviews, readings, and other means.
3. To draw conclusions about how to develop, manage, or leave that resource alone.

Introduction:

We often take our environment for granted and accept the development or non-development of natural or cultural resources as responsibilities of someone else. We forget that, as citizens of a town, we have a say in the quality of our local environment and that after study, we can make recommendations for change and development.

In this activity, students select a local resource, find out more about it, and make recommendations for improving the quality of the environment.

Procedure and Activities:

Directions: Investigate a natural or cultural resource in your town and create a proposal for how it should be developed, managed, or left alone. Possible areas for investigation:

A park
Historic sites and markers
Historic buildings
The shoreline of a lake or river
Traffic patterns
Government buildings
Sewage treatment plant

Your report should include answers to the following questions:

1. What have you identified as a local resource?
2. What are the problems and opportunities associated with the resource?
3. Do the residents value it? Explain.
4. What should be done to change it, if anything?
5. What is the estimated cost (in dollars) if changes are made?
6. What are costs to the environment if the changes are made?
7. What are the benefits to the people and the environment if the changes are made?
8. What are some other interesting facts which you learned about the resource?

Note: You are to submit a written report of your findings.

Evaluation:

1. What local natural and cultural resources did you discover for the first time?
2. Are some of the recommendations for improvement possible to implement?
3. What are the next steps to follow if these improvements are to be made?

15. RESTORING NATIVE VEGETATION

Problem: What kind of cooperative actions can citizens undertake to help improve the environment?

Objective: To work together as a group and have an enjoyable time while helping to improve the local environment.

Introduction:

Many students may want to volunteer to do projects which improve the area around the school or a nearby park. While many of these projects involve cleaning up a neglected site, they often involve the improvement of the habitat through planting trees, shrubs and flowers. An important idea in student planting projects is to select plants native to the area which are well-adjusted to local climate conditions and require only minimal care to survive. Selecting the proper plants becomes a technical concern which usually requires the assistance of someone competent to make such recommendations.

Procedures and Activities:

1. Establish contact with a local individual or group interested in the restoration of native vegetation. Tell them of your hope to interest your students in such a project.
2. Introduce the idea of students using their planning skills to restore native vegetation in local areas.
3. Develop the general principles for restoring native vegetation to the school site or other selected areas. Be sure to get permission to do the project from appropriate officials.

4. Within the stated principles and goals, have the students develop realistic plans for the restoration project.
5. Discuss criteria for selecting a suitable restoration plan and have a panel of students select the plan after presentations by other students.
6. Submit the plan to appropriate officials, including someone expert in selecting native vegetation.
7. Seek funding assistance to purchase materials for planting. (Scale down the project, if necessary, due to limited funds.)
8. Under the supervision of a technically competent person, develop a work project schedule with students and implement the plan.

Evaluation:

1. What were the problems and joys of doing this group effort?
2. What were the benefits to individuals and society from such positive citizen actions?
3. How should the plantings be maintained over time?

16. KEEPING THE EARTH ALIVE

Problem: What can citizens do in their personal lives to help improve the quality of the environment?

Objectives:

1. To create an awareness in students that their behavior has an impact on the environment.
2. To do something about lessening the adverse impact of their behavior on the environment.

Introduction:

This activity should be preceded by a brief discussion of how good citizens contribute to the well-being of their community. If citizens express the value that they want to live in a quality environment, then their behavior should be consistent with that goal. There are many ways citizens can act to reduce unnecessary consumption and improve the quality of the environment. By behaving in environmentally sound ways, the need for laws or other actions by government is reduced.

Procedures and Activities:

1. Introduce a list of some things other students decided to do to improve the quality of the environment:
   a. Walk, ride the bus, or go in car pools to travel, rather than having your parent drive you alone.
   b. Plant trees in approved areas at home, school or park.
   c. Use cold water and low phosphate soap to wash clothes.
   d. Don't use products, including soft drinks, that come in nonreturnable containers.

e. Develop a natural area at home, school or within a park.

f. Encourage your parents to buy energy-efficient appliances.

2. Ask the class for additional ideas and have them generate their own list of things they can do to help keep the earth alive.
3. After the list is developed, ask students to name one good environmental behavior they already possess. Write down their names after one of the good behaviors they already possess.
4. Then ask them which behaviors they will try to practice for the next week or two. List their names next to those behaviors they have pledged to attempt.
5. Discuss with the class the goals they have set and explain that goals can help them achieve new patterns of behaving if they are realistic, challenging and achievable.

Evaluation:

1. What has been accomplished in meeting the goals of helping to save the earth?
2. What rules and laws would be eliminated if everyone agreed to do a particular action to improve the environment?

17. SOMETHING'S FISHY*

Problem: What is the nature of economic exchange and related environmental concerns in today's society?

Objectives:

1. To investigate why fish imported from great distances occupy a major portion of the available supply at a local store in contrast to fish caught locally.
2. To discuss the environmental or energy benefits of using fish caught locally.
3. To compare the processing methods of local fish to those originating from distant markets.

Introduction:

Many of the foods we eat today are shipped great distances and are processed in a variety of ways. This was not always the case. In early times, for example, fish were eaten as they were caught or stored through drying and pickling. Fish today might be caught and frozen in the Arctic and flown to markets in distant places.

This activity is designed to create an awareness of the extent of this process and involve students in a discussion of its benefit to people and its impact on the environment.

Students will be asked to gather data according to a format which will serve as the basis for subsequent discussions.

Procedures and Activities:

1. Hand out the data-gathering guidesheet for student use.

2. Explain that they will be expected to find fish products in each of the following categories--frozen, fresh, canned, dried, pickled, and contained in prepared foods and other products.
3. They should carefully read the labels on the fish products to determine where the product originated, the kind of fish and its origin.
4. By using reference materials, students can determine where the fish was caught. Use a globe or atlas to determine the distance between where the fish lived and your town.
5. Student access to fish and fish products can be handled in any of the following ways:
    a. Students as a class can go to the fish market and gather data under teacher supervision.
    b. Students in small groups after school may gather the data by going to a local store on their own.
    c. Students can use the fish products in their own homes as the basis for gathering data on the various products.
6. After gathering the data, students should answer the following questions and be prepared to discuss them in class:
    a. What is the farthest or shortest distance the fish has traveled?
    b. Where do the fish you prefer to eat come from?
    c. How many local fish did you find in contrast to those shipped more than 100 miles?
    d. In terms of price per pound, which fish is the most expensive? Which is the least expensive? How do you explain the differences in price between the most expensive and least expensive fish product?

Evaluation:

1. Why do fish shipped from great distances occupy such a large portion of the fish available for purchase?
2. Did products from local sources (less than 100 miles) appear in as many processed forms as those from more distant places or were they frequently sold as fresh or frozen fish?
3. Are there any environmental or energy benefits or risks from using more fish from local sources in your diet?

FISH AND FISH PRODUCT SURVEY SHEET

	Fish Name/Product	Source	Price/Item/lb.	Distance from Your Hometown
Frozen				
Fresh				
Canned				
Dried				
Pickled				
Found in Prepared Foods				
Found in Other Products				

* This lesson was adapted from materials developed by a U.S. Sea Grant Project at the University of Michigan.

18. ENERGY COSTS MONEY

Problem: How much energy does your family (or school) use to heat or cool their building?

Objective:

1. To create an awareness of how much energy it takes to heat or cool a specific building.
2. To list ways in which less energy can be used while still supplying similar benefits in using the building.

Introduction:

While our energy crisis has lessened, energy resources like coal, oil and gas are still nonrenewable. At some point they will run out. Also energy is expensive, and any energy cost savings will allow your family to do other things with the money saved from buying less energy. The same is true for a school system. Therefore, saving energy saves resources for future generations, reduces current pollution problems, and provides the opportunity to spend money on other things.

Procedures and Activities:

1. Get copies of your monthly energy bills indicating how much energy was used to heat or cool your home (or school) for one year.

2. Make a chart (like the following) to report your use on a monthly basis.

GAS (OR OIL) UTILITY BILL FOR ONE YEAR

Month	Days	Cost ($)	Therms	Cents/Therm
January	31	37.10	202	18.37
February	28	40.14	215	18.69
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				
Totals				

3. Also make a chart to illustrate your monthly use of electricity.

ELECTRIC BILL FOR ONE YEAR

Month	Days	Cost ($)	Kwhr.	Cents/Kwhr.
January	31	16.26	448	3.63
February	28	16.45	459	3.58
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				
Totals				

4. Send for materials from the gas, oil and electric companies which suggest ways to save energy to heat and cool your building.
5. Gather additional energy savings ideas from books and magazines in the library. Magazines such as *Popular Science* and *New Shelter* are excellent references.
6. Investigate your building to determine which energy savings techniques are already being practiced. Discuss the possibility of trying more of these techniques in your building either with your parents or school personnel.
7. Select the savings techniques you will implement and work to implement them.
8. Estimate how much energy might be saved from your conservation techniques and express the savings as a fraction or percent of the amount currently used. Use that same fraction or percent to estimate how much money would be saved on a monthly and yearly basis.

Evaluation:

1. Were you surprised by the amount of energy and the cost of heating or cooling your building?
2. Assume you spent $100 to save the energy, and it saved you $50 in energy costs the first year. How long will it take for your savings to pay for the cost of saving energy?
3. After you have paid for the cost of saving energy, what other energy conservation efforts might you implement?
4. What else might you consider doing with the money you saved?

MORE SOCIAL STUDIES PROBLEMS

1. How have people affected the natural environment?
2. How has the natural environment affected people?
3. Make a sketch map of a home site and other features such as outbuildings, well, pond, road, or cellar. Why was each located where it was?
4. Based on examining an old foundation, how do you think the building might have looked when it was occupied?
5. How were some old tools used to make life easier?
6. How can you make a fire with flint and steel, and with bow and drill?
7. How were old buildings constructed?
8. What types of people lived at an old farmsite at various times?
9. How do societies encourage and limit individual behavior in the outdoors?
10. What is the proper way to behave on trips to outdoor areas?
11. How much pollution can the earth absorb before it affects the quality of our lives?
12. What should we know before we alter or develop a natural area for human use?
13. How did the local streets and buildings get their names?
14. What happens to the waste water when we unplug the sink or flush the toilet?
15. What resources are obtained from beneath the earth's surface in your area?
16. What happens if someone is caught vandalizing a park?
17. Where can we purchase necessary goods and services in the community?
18. What natural materials have been used to construct the school and to develop the schoolyard?

19. Where would the water level of a pond be located if a dam of a certain height were constructed?
20. What are the dominant vegetation types shown on an aerial photograph?
21. How can topographic maps be used to find our way around?
22. Can you find the locations of benchmarks (indicated elevation) with the aid of a topographic map?
23. Can you determine the azimuths to landmarks within sight?
24. Using a map and compass can you walk to landmarks that are not visible from the starting point?
25. Is there a relationship of the slopes of the land to the amount of soil erosion in each place?
26. Can you make a shadow clock to tell the time of day and then relate the shadows to compass directions?
27. What are the main features of the landscape surrounding you?
28. What are the main ways in which the land is used in your region?
29. What are the different ways in which buildings are used in a part of your town?
30. Why types of traffic flow past a certain point on a busy street?
31. What basic skills are needed in order to survive?
32. What human evidence can be found in a vacant lot?
33. How do people's environmental life styles differ?
34. How much are people in the community willing to pay to improve the air and water quality?
35. What do local traffic patterns reveal about the role of transportation in our lives?
36. What stories can an old dumpsite tell about the people who lived there?

37. What can a cemetery reveal about the community and local area now and in the past?

38. What are the steps involved in writing a new environmental law?

39. How do people use the outdoors for recreation?

40. What can a zoo teach us about social behavior of people?

CASE STUDIES: USING THE OUTDOORS TO TEACH SOCIAL STUDIES

Introduction:

Teachers and schools do make use of the outdoors and the community to teach the social studies. The following program descriptions or case studies illustrate what a few of them have done.

OUR OHIO HERITAGE - AN OUTDOOR PIONEER UNIT

John Dean Freund

Background

The city of Worthington, a suburb of Columbus, Ohio, is located in northern Franklin County. The Worthington City Schools serve a population of about 30,000 people.

One of the unique features of Worthington's history is that it was established before Ohio became a state. Understandably, the settlers who moved from Granby, Connecticut, brought their New England heritage with them. The village was platted in characteristic New England fashion. It was laid out around a village green. Parcels of land were set aside for the establishment and maintenance of a church and school. The farsighted and unequivocal commitment to education continues in Worthington today.

Ownership

Perry Middle School is one of two middle schools in the Worthington School District. In order to retain team teaching, which has characterized the instructional process at Perry Middle School, it was necessary for one team to have 60 seventh graders and 60 eighth graders. This team was designated the 7-

3/8-3 team and included Pat Barron--Science, Janet Lanka--English, Becky Mejie--Math, and Bob Wightman--Social Studies.

During the first year the "split team" encountered two major problems. One problem involved "pecking order," that is, eighth graders versus seventh graders. The other problem was a community perception that this particular group of students were not "academically talented" because they were not taking algebra.

The teachers of the 7-3/8-3 team decided it was necessary to create a program or experience that would (1) build team rapport, and (2) emphasize the strengths of their students in order to change an inaccurate community perception. The proposed solution to these problems would use "Our Ohio Heritage" as a unit theme. This unit would emphasize student research skills for information-gathering purposes. Activities in a resident outdoor education setting would provide the students with a direct, hands-on, sensory base for this unit of study. The 7-3/8-3 team's "Our Ohio Heritage" program was implemented during the first semester of the 1982-83 school year.

Rationale and Goals

Liberty Hyde Bailey, Dean of the College of Agriculture at Cornell University in the early 1900s, viewed teaching as a holistic endeavor. Bailey stated that nature study or study in a natural setting "is putting the child into intimate and sympathetic contact with the things of the external [outside] world." Smathers (cited in Robert M. Wolff's 1978 unpublished dissertation) gives the following view, contrasting life today with early American life: Life today is " . . . information rich, and experience poor. People are living vicariously, without risk or responsibility. We are spectators instead of performers." Early

American life " . . . was information poor, and experience rich. Daily life *was* the adventure."

The 7-3/8-3 team, feeling some of the same needs, established the following three major goals:

1. To put the students in a setting where they can experience the American way of life before the onset of modern technology.
2. To strengthen the students' awareness of the interrelationship between the four team disciplines.
3. To help meet the goals of Team 7-3/8-3: (a) to increase interdisciplinary teaming, (b) to build team rapport, and (c) to further develop student self-discipline.

To accomplish these goals, a 12-week program was designed. It included class assignments, a guest speaker who modeled and discussed pioneer dress, field trips to local community resources such as the Orange-Johnson House (a restored early 1800s Worthington residence), the Ohio Village (a replica of an early 1800s Ohio village), and an extended field trip to a resident outdoor education facility which provided a simulation of selected pioneer living experiences for the students.

At Camp: Staff and Activities

Finally, the November day arrived to go to camp. The outdoor experience patterned after daily life in the late 1700s was just an hour away. The staff included the teaching team from Perry and several non-team members from the school, the regular staff from the resident outdoor education facility, a number of parent volunteers, and high school student assistants. Everyone did their part

to contribute to the rich variety of activities which characterized "Our Ohio Heritage" at camp.

A brief description of four pioneer activities will give some sense of this very special social studies camp curriculum. By using the following examples, attention may be focused on the nature of the activity, the nature of student involvement, and the number of students in each activity group.

"Pioneer Living Skills" is a series of activities which represent some of the "chores" one would typically encounter around a frontier cabin. They include making soap and apple butter, use of pioneer tools, spinning and carding, making and using natural dyes, quilting, candle dipping and making pioneer toys. This is a hands-on activity for very small groups of students or individual students.

"The Pioneers Move West" is a simulation which allows the students to play the role of one of six family members who are moving from New England to the old Northwest Territory. After the introduction, groups of 6 organize into families (group sizes of 12, 18 and 24 work well), buy necessary animals, food, clothing, tools and weapons, and then begin their simulated 600-mile westward journey.

"The Living History Hike" is role playing, too. In this case, members of the camp staff play the roles. These frontier portraits include a hunter, a pioneer woman, a surveyor, and a midwife. Imagine the startled looks on the girls' faces when the midwife asks their ages and then advises them to marry soon or risk becoming "old maids" at the tender age of 13 or 14!

The preparation of the pioneer dinner is one of the many highlights of the camp experience. The pioneer meal consists of stew, rolls, and butter, topped off with cobbler and ice cream. Participation is very good during the

preparation time and even better when it's time to eat. Group size is determined by the food items being prepared and the number to be served.

Evaluation by students, parents, and staff has been an on-going part of "Our Ohio Heritage" program. The comment of one student typifies the feelings of most participants: "It was interesting and more than I could learn in school." Social studies in the outdoors can bring new vitality to your curriculum.

For further information, contact:

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HOW WE DEVELOPED PROJECT C.A.R.E.

Richard Ammemtorp

Project C.A.R.E. is an energy education program emphasizing **C***onservation* **A***wareness, and* **R***esponsibility for* **E***nergy.*

Several years ago, while teaching a science lesson in my fifth grade classroom, I called upon several students to open a can. I handed one of them a manual can opener. After several minutes had passed, the student returned, claiming, "We don't know how to get the can open with this . . . Where's the can opener?" "This is a can opener!" I replied. None of them had ever seen one before. This prompted me to ask the entire class if anyone knew the name and/or purpose of the implement. About two-thirds of the class did not know. When asked how cans were opened at home, all responded that electric can openers were the only way! They said if the electricity goes out, "You just don't open a can!"

Choices, alternatives, and *need* for electricity. These types of issues were running through my mind. Students of today need to experience current issues in order to make decisions for the future. Energy use, need, conservation, waste--unless students begin to understand these concepts at an early age, they will not have the foundation to understand this complex issue. Basically, our society has had a "live for today" attitude. We talk about affecting the future by what we teach and how kids learn. The only time we react is when an emergency threatens the status quo; for example, the gas shortage of 1973. Then we take action because we have to. But most corrective actions have only been temporary to some degree. The root of the problem must be dealt with directly, and decisions must be made with regard to the long range view.

The goal in developing Project C.A.R.E. was to provide an opportunity for students, teachers and parents to understand energy issues, increase their energy awareness, develop attitudes and behaviors towards saving energy and the environment, and to develop a society that is concerned about and committed to the wise use of energy for future generations.

The first task was to develop a way of implementing energy education into an already overcrowded curriculum. The idea of selecting and working with a small group of students had already been successfully developed with an environmental program called "Spaceship Earth." The idea needed to be extended, however, with the emphasis directed towards utilizing a cadre of 10-15 fourth - sixth grade students to teach energy concepts to their peers.

A grant proposal was submitted to the Illinois State Board of Education to develop an energy curriculum that would train these cadres of students to peer-teach energy concepts to their classmates, as well as involve local schools in all-school energy awareness campaigns and programs.

The curriculum was developed du ing the 1978-79 school year, and students and teachers began the program the following year. Continuous revisions were required as each year progressed until 12 2 1/2-hour lessons were established. These covered nine major energy concept areas.

A 5-day resident program, called Energy Encounter, was also developed and implemented to further enhance the students' understanding of leadership skills, cooperative decision making, practicing classroom theories and the idea of conservation.

The concept of "peer-teaching" the energy concepts took the longest to develop. Lessons were written and were piloted in classrooms at all grade levels.

Evaluation results and feedback from classroom teachers provided necessary information in developing the final format and content areas.

The grant from the Illinois State Board of Education lapsed during the 1981-82 school year and since then the program has been supported totally by the Schaumburg District 54 Board of Education.

The support from the C.A.R.E. teacher representatives, the teaching staff of the elementary schools, the administration and the board of education has been appreciated in this endeavor. Parents and students have been directly involved also. We hope that our C.A.R.E.ing will be the beginning of a long range goal dedicated to the preservation of the earth and its natural resources.

For more information contact:

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ENERGY ENCOUNTER

Energy Encounter is a 5-day outdoor resident program that culminates the C.A.R.E. Kids' involvement in C.A.R.E. It serves as a "practice what you preach" situation, incorporating many of the energy concepts and C.A.R.E. value concepts that have been taught throughout the year.

The role of the C.A.R.E. coordinator and C.A.R.E. teacher diminishes during the year to the point where the C.A.R.E. Kids are required to make most of the decisions themselves. These decisions especially involve planning for and implementing the Energy Encounter experience.

The C.A.R.E. Kids are allocated a certain amount of "energy units." These units "pay" for anything that requires energy. For example, shelter is something that is necessary to exist at the Energy Encounter Camp for the four nights. Options are given to the C.A.R.E. Kids based on the premise that the C.A.R.E. cadres should practice as energy efficient a lifestyle as they can all agree on. The range is from a "hotel" type accommodation (at 400 energy units per person per night), to a "make your own" accommodation (at 10 energy units per night). The individuals in a cadre must decide among themselves which shelter they "need." The same is true with food selection and preparation, waste disposal, water use, and recreation.

Recreation is monitored using "Energy Coupons"--something the C.A.R.E. Kids have earned all year long by completing basic responsibilities. Each C.A.R.E. Kid *must* earn 90 energy coupons to pay for transporting them (and their luggage) to and from the Energy Encounter Camp. If C.A.R.E. Kids wish to bring something from the non-required list of equipment, they must "pay" for these items with Energy Coupons earned above the 90 required. An example might be a frisbee--not a necessary item but one that could be enjoyed. There is a five Energy Coupon fee for bringing this item to Energy Encounter. The more energy-intensive the item, the more Energy Coupons it would cost. A color television "costs" 1,000 Energy Coupons!

During the 5 days, the C.A.R.E. Kids live out their decisions. Most stay in non-heated dorms. On the colder nights, instead of paying additional energy units for heat, the C.A.R.E. Kids push their bunks together and keep warm using alternative, less "expensive" means. The cadres usually decide to prepare their own meals over a campfire rather than a gas camp stove and share the cooking responsibilities.

Included in their day are lessons stressing energy awareness, energy use, energy alternatives or safety. Orienteering courses take them past solar collectors, a windmill, or electric meters. A geology pit invites them to look for fossils, and relates directly to the use of fossil fuels. Pond and forest ecology stresses the interdependence of the natural energy systems that exist, and compares these with how we alter these natural systems and pay the consequences. Hot air ballooning, banner making, leather craft (the old-fashioned way), silk screening, solar cooking, wind craft races--the list of other activities is extensive.

One special experience is known as "Wilderness Survival," in which the C.A.R.E. Kids plan everything they will need to survive for an entire day in a rustic campsite. Everything they "need" has to be carried (using their muscle power) to a site on the other end of Peter's Lake. Tents are backpacked, along with food for dinner and breakfast, and the C.A.R.E. Kids participate in what always is a very memorable experience. Special activities include sensory awareness, a "magic" circle of friendship, and a "night watch" in which the fire is kept going all night as the C.A.R.E. Kids share different shifts and log events in a nighttime journal.

There is a time for recreation in a game room with ping pong and fooseball (only one Energy Coupon per game) or electronic air hockey (at five Energy Coupons per game!) and outdoor boating, or playing volleyball.

On the last day, after everything has been cleaned up and inspected, the C.A.R.E. Kids stop at Old World Wisconsin for a brief trip into the past. Here, the interpreters show them how people of the late 18th Century *had* to save energy in order to survive and how conservation wasn't a fad, but a reality of life. Hopefully, the week's experiences combined with this look into the past

give the C.A.R.E. Kids a sense of reality when we discuss energy--the issues, the problems, and the alternatives for the future.

Editor's Note: The program described is one aspect of Project C.A.R.E. which was the 1982 National winner (junior division) of the National Energy Education Day (N.E.E.D.) Project.

ARCHEOLOGY FOR STUDENTS

Karen Ann Holm
Director of Educational Programs
Center for American Archeology

Archeology for students? YES! Since 1971, over 17,000 students have participated in archeological research programs at the Kampsville Archeological Center. Why have we offered such programs, and why have so many schools participated in this program? There is not just one answer to these questions, but many.

First, archeology is a science--an academic discipline which requires attention to detail, interpretation and deduction, commitment to a task, and problem-solving skills. It's an interdisciplinary study which requires teamwork and the ability to follow clear directions in a "real" research setting. Often, it is a student's first, and only, opportunity to participate in an on-going scientific research project.

Second, archeology exposes students to thousands of years of human history and to different civilizations and lifeways. This exposure can help students develop new insights into contemporary cultures and current problems. It can also lead to great cross-cultural understanding.

Third, archeology allows students to apply existing skills and knowledge in a research setting. In school, they have studied the scientific method, learned to plot points, to take notes, to write legibly, to make observations and to look for patterns. In archeology, they must do all that and more. Working closely with the researchers and field archeologists, students see a purpose for these skills. They are working together toward a common goal. Their work "really counts" in that it is contributing to the body of scientific knowledge and to our

understanding of the past. In school, they often learn facts; in archeology, they see how facts come into being and how facts change as new discoveries are made.

What does one do in an archeological field school? While there is no one standard schedule for such a program, there are certain underlying principles and core activities which make for a strong, coherent program. First, students must be introduced to the nature of archeological research--what archeology is, why we do archeology, and the types of questions explored by archeologists. Through slides and discussion, the nature of the archeological record and archeological recovery processes should be explored. Stress should be placed upon the interdisciplinary nature of archeological research as the students explore the ways in which various scientists contribute to our understanding of prehistory. During this session, students should also be introduced to the specific research questions for the site they will be excavating. Especially when working with junior high students, we have stressed the idea, "It's not what you find, but what you find out."

The introductory sessions should also include a discussion of site formation. Goals of this lesson should include student understanding of basic terms (e.g., site, plow zone, midden, sterile soil, provenience, grid system, feature, mottling, datum, context, *in situ*, artifact, post mold), of types of geological and cultural deposition (as well as the difference between the two), and of basic steps in the archeological recovery and analysis process.

One very effective way of teaching this information is to have students make observations at a "model" surface site. We often used our replicated Indian village for this purpose. First, ask the students to observe the site. They usually begin by focusing on the large, highly visible parts--in our case, the house, the

stockade, the pit kiln. Then they begin to focus on the ground. They see the chert flakes, the shells, the charcoal stains and pieces. Begin to discuss the "pieces," and soon they are discussing "patterns" and "activity areas." Observations are made, questions asked, more observations made. Questions stimulate thinking. New ideas and interpretations are offered. Original assumptions and interpretations are challenged and/or supported as more evidence is examined.

The stockade offers a good chance to observe, propose hypotheses, and test ideas. It was once more extensive. The students look for evidence of its original location. They identify each post's location by a stain or pattern in the ground or by prediction: extrapolating based upon known locations. Thus, students learn another abstract lesson in patterning and prediction by starting with the concrete and familiar.

Another highly critical session is an "Introduction to Debris." The goal of this activity is to familiarize students with debris classes commonly found at the site. Students make scientific observations of debris characteristics and use these characteristics to assign debris to the appropriate material class. The session begins with a discussion of debris as garbage, and of the biases which arise from hypotheses based upon garbage alone. Next, review principles of scientific observation of an object's key properties. For demonstration purposes, use a piece of chalk. Ask students to describe the object in concrete terms. Show a second piece, of different size and/or color. Ask how they are alike. What characteristics do they share? Thus, you have shown them how to move from one piece to a material class (Holm, 1985).

Before any excavation is undertaken, students must learn how to dig. A site tour, a demonstration of digging techniques, and a lesson in mapping objects

to scale on the field note form are all part of this session. Concepts and information presented earlier are reviewed and reinforced at this time, while stress is placed upon specific techniques of digging and mapping which each student must master.

Throughout the field school, new concepts and content should be introduced as students advance in their understanding and skills. Experience has shown that junior high students do best when excavation is limited to half-days, while senior high students can often excavate for 1 or 2 full days in a week. Of course, if the program is conducted for longer than a week, the amount of digging time can be increased for both age levels. Junior high students can accurately perform such field activities as excavation, piece-plotting, debris collection, and flotation sample collection given adequate professional supervision (1 staff member to 10 or fewer students). Senior high students can perform more tasks than junior high students. They can excavate, piece-plot, collect debris, flotation and soil samples, and write some field notes (Cook, 1985).

Excavation should be supplemented by laboratory work. Have students do the work which needs to be done on that day. A lab session might begin with a slide show illustrating the flow of debris and samples from the field, through the laboratories, and to the researcher preparing the site report. Then give specific directions for the lab task the students will work on. Usually washing or sorting debris is best for the first lab activity. As students wash, sort, and bag debris, they review and strengthen their skills of observation and identification. This is also a good time to introduce new information pertinent to the pieces being processed. Some students could be involved in the water separation of flotation samples or in tabulation, especially if they are older and

involved in longer programs. A student with skill in computers could perform tasks of data entry and editing. Others could be trained to inventory material for curation purposes (Cook, 1985).

While an archeological field school for junior or senior high school students must be professional and uphold standards of quality archeological research, it should not attempt to turn junior and senior high students into professional archeologists. Rather, such programs should aim to involve students in an archeological research project in a manner which is meaningful to the students and productive for the researcher. Therefore, approximately half of the students' time should be spent in activities which develop a framework for archeological investigation and in exploring related fields of study. The teaching of Native American technologies (flint knapping, cordage, pottery-making, house construction, finger weaving), culture history, ceramics identification, resource location and use, and the seasonal round provide a solid background for understanding the field and laboratory work.

These related activities are most effective when they use a "hands-on" approach. A piece of chert found at a site takes on added meaning after the student has searched the landscape for the rock, broken it into pieces, and shaped a flake into a tool. A house pattern makes more sense after students have worked on reconstructing such a house, or have gathered round the fire and heard an ancient story of the Native Americans. Culture history can be taught through the game, "A Culture History Mystery," designed by Ms. Lisanne Bartram. This game uses artifact casts, replicas, and clue cards to present the prehistory of the lower Illinois River valley. Students use these clues to describe each of the prehistoric cultural time periods in the valley, and then arrange the

cultures in chronological order. The ensuing discussion focuses on concepts of cultural development and culture change.

Participation in an archeological field school is a marvelous way for students to become involved in their own learning. It provides an opportunity to work with researchers, to experience the thrill of discovery, to be part of a larger, meaningful project, to contribute to the wealth of human knowledge. The experience often ranks as a highlight of the student's school years. As M.J. Rice, Director of the Anthropology Curriculum Project has stated, "Get out of the classroom; involve your students in archeology. You and they will be richer for the experience."

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Editor's Note: The educational program at the Kampsville Archeological Center received the NSTA National Exemplar in Science Education award in 1983. The Center's archeological program for junior high students was terminated after 14 years of operation. For more information about archeology in school programs write:

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HIGH SCHOOL STUDENTS EXAMINE ENVIRONMENTAL PROBLEMS IN THE LOCAL COMMUNITY

Barbara A. Barchi

High school students throughout the country are engaged with complex environmental problems as they apply science and social studies knowledge acquired in the classroom in examining local community concerns. Students of all ability levels have benefited from a project developed by teachers at the LaSalle-Peru (Illinois) Township High School and cited as exemplary by the U.S. Department of Education and the Environment and Technology Project.

The Environment and Technology Project uses problems close to home. Students find that their community, like most other places, has plenty of them. After studying essential science and social science knowledge in their classroom courses, students apply their knowledge to the resolution of local problems in the areas of land use, pollution, urban management, and energy. The project is designed to help high school students become good problem solvers. Pupils learn to recognize a problem, look for possible solutions, and then decide which solution is best.

How do students identify local problems and how do they gather information? Students begin problem identification with the local newspaper. The newspaper identifies problems, the people involved, various agencies and concerned groups. As students clip the articles, a file is soon developed which serves as a continuing resource. Students expand the information by contacting actual resource allocators, decision makers and others. Outside speakers from the local business and government communities are often visitors in the classroom. Students go out into the community to gather information "on-site" using a

variety of techniques: surveys, interviews, and field study, including scientific investigations such as water and soil sampling.

The Environment and Technology Project provides students with a wide choice of topics to study and examine in the community. In a semester course, students would study at least one topic in each of four categories: Land Use--urbanization and zoning, streets and roads, parks and recreation, and wildlife; Pollution--air, water, noise, and rural; Urban Management--solid waste, waste water, and population; Energy--gasoline, electricity, nuclear power, coal and solar.

Students, as they study any of the topics, are encouraged to interact with the community. They start by interviewing local government officials, business people, and politicians. If they examine noise pollution, their study might take them to the local expressway, the airport, a factory, or the school setting itself. If they are studying nuclear power, they might examine the disposal of nuclear waste or medical uses of nuclear energy. Students use a range of resources such as public documents, city council minutes, and pro/con newspaper articles. They also contact appropriate agencies, such as the public utility company, the water planning board, and the Soil Conservation Service.

A problem-solving model is used as a guide for students. The model has three basic steps and is used in all local problem investigation. First, students define the problem by telling what is going on, the impact, and how pressing a need for its resolution is. In this step, students examine the problem from different perspectives: scientific, legal, aesthetic, economic, emotional, political, and ethical. Secondly, students propose solutions, applying related background knowledge and local problem information. Finally, in the third step, students are asked to find the most appropriate solution. The proposed solution is evaluated

through analysis of its probable impact (using the various perspectives from the first step), whether the solution can be put into use and whether it will be in time.

The problem-solving model is weighted between scientific and social concerns and presents a balanced view of the needs of a technological society and the needs of the environment. Students learn about the complex nature of environmental problems as they look for short- and long-term consequences, analyze risks and benefits and recognize their own values.

Students end their investigations by sharing their study in a variety of ways: through videotapes, slide shows, photograph displays, and other reports. They share their findings and views with those whom they interviewed, with their families, and with the community. Pupils also make recommendations and initiate action. Applying classroom-acquired knowledge to local community problems enables students to participate in making decisions based on sound technological choices.

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